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- ²²Bodenheimer, F. S. 1935. Animal life in Palestine. L. Meyer, Jerusalem.
- ²³Rivnay, E. 1962. Field crop pests in the Near East. (Monographiae Biological, Vol. 10) W. Junk, The Hague.
- ²⁴Chopard, L. 1963. Notes sur la fauna des Orthopté roïdes d'Israel et de quelques region limitrophes (Blaltodea, Gryllacridoidea, Gryllodea), Bulletin of the Research Council of Israel, IIB:161-176.
- ²⁵Jones, Arthur J. 1972. A general analysis of the Biblical kind" (min), Creation Research Society Quarterly, 9 (1):53-57 (June). ²⁶Ibid.

Annotated Bibliography

(In chronological order per section)

1. The Fauna of Palestine

- Hasselquist, F. 1766. Voyages and Travels in the Levant. L. Davis & C. Reymers, London. The original edition (1757) was in Swedish. An old but very useful work.
- Tristram, H. B. 1884. The survey of Western Palestine: the fauna and flora of Palestine. The Committee of the
- Wood, J. G. 1892. Bible Animals. New edition (First edition 1869). Longmans, Green & Co., London.
 Mcinertzhagen, R. 1930. Nicoll's birds of Egypt. Two
- volumes. Hugh Rees Ltd., London. Covers all but a few of the Palestine birds.
- Bodenheimer, F. S. 1935. Animal life in Palestine. L. Mayer, Jerusalem.
- Bodenheimer, F. S. 1958. The present status of the terrestrial mammals of Palestine, Bulletin of the Research
- Council of Israel, 7B:165-186. Bodenheimer, F. S. 1960. Animal and man in Bible lands. E. J. Brill, Leiden. Detailed treatment of clas-
- sical authors and the archaeological evidence. Driver, G. R. 1955. Birds in the Old Testament: I. Birds in law, Palestine Exploration Quarterly, pp. 5-20. Detailed analysis of the Hebrew names.
- Harrison, D. L. 1959. Footsteps in the sand. Ernest Benn, Ltd., London. Field notes on the small mammals and birds of Mesopotamia and Palestine.
- Harrison, D. L. The mammals of Arabia. Vol. I (1964) Introduction, Insectivora, Chiroptera, Primates; Vol. II (1968) Carnivora, Artiodactyla, Hyracoidea. Ernest Benn Ltd., London.
- Rivnay, E. 1962. Field crop pests in the Near East. (Mo-nographiae Biologicae, Vol. 10) W. Junk, The Hague.
- Chopard, L. 1963. Notes sur la faune des Orthoptéroïdes d'Israel et de quelques regions limitrophes (Blattodea,

- Grylacridoidea, Gryllodea), Bulletin of the Research Council of Israel, 11B:161-176.
- Goddard, B. L. 1964. Animals of the Bible. The Encyclopedia of Christianity. E. H. Palmer, Editor. Vol. I, pp. 219-249.
- Goddard, B. L. 1968. Birds of the Bible. The encyclopedia of Christianity. G. G. Cohen, Editor. Vol. II, pp. 80-104.

These articles by Goddard are useful surveys, but contain no new material.

- Yom-Tov, Y. 1966. On the taxonomic status of the genus Lepus in Israel, Israel Journal of Zoology, 15:29. Suggests that the polymorphic species L. capensis includes L. europaeus.
- Cansdale, G. 1970. Animals of Bible Lands. The Paternoster Press, Exeter, Devon. 2. Systematics – 2.1. Vertebrates
- Romer, A. S. 1966. Vertebrate Paleontology. Third edi-tion. University of Chicago Press, Chicago.

2.2. Mammals

- Walker, E. P. et al. 1964. Mammals of the world. Two Volumes. The John Hopkins Press, Baltimore.
 Morris, D. 1965. The Mammals. A Guide to the living
- Species. Hodder and Stoughton, London.
- Ellerman, J. R. and T. C. S. Morrison-Scott. 1966. Checklist of Palaeartic and Indian Mammals, 1758-1946. Second edition. (First edition 1951). Trustees of the British Museum (Natural History), London.
- 2.3. Birds
- Grossman, M. L. and J. Hamlet. 1965. Birds of prey of the world. Cassell & Co. Ltd, London.
- Peterson, R., Mountfort, G. and P. A. D. Hollom. 1965. A field guide to the birds of Britain and Europe. New edition (First edition 1954). Collins, London. Covers almost all the birds on the Palestine list.
- 2.4. Orthopteran Insects
- Uvarov, B. P. 1928. Locusts and Grosshoppers. The Imperial Bureau of Entomology, London. Chopard, L. 1949. Ordre des Orthoptères. In Traité de
- Zoologie, Anatomie, Systém atique, Biologie (Ed. P.-P. Grassé), Vol. 9:617-722. Brues, C. T., Melander, A. L. and F. M. Carpenter. 1954.
- Classification of insects, Bulletin of the Museum of Comparative Zoology at Harvard College, 108 Second edition. (First edition Ibid 1932,73).
- Ragge, D. R. 1955. The wing-venation of the Orthoptera Saltatoria. Trustees of the British Museum (Natural History), London.
- Dirsh, V. M. 1961. A preliminary Revision of the families and subfamilies of Acridoidea (Orthoptera, In-secta), Bulletin of the British Museum (Natural History), Entomology, 10:349-419.

BRASSY SERPENTS ASSIGNED ROLE OF GUINEA WORMS

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Many facts are presented to establish the position that the brazen serpents which bit the children of Israel in the wilderness of the Arabian desert were literal venomous snakes, and not guinea worm attacks as stated in parasitology textbooks. The miracle of instantaneous healing from a look at a brass snake on a pole is readily understood in light of John 3:14, 15.

And the people spake against God, and against Moses, Wherefore have ye brought us up out of Egypt to die in the wilderness:

for there is not bread, neither is there any water; and our soul loatheth this light bread.

And the Lord sent fiery serpents among the people, and they bit the people; and much people of Israel died. Therefore the people came to Moses, and said, We have sinned, Lord, and against thee; pray unto the Lord,

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that he take away the serpents from us. And Moses prayed for the people.

And the Lord said unto Moses, Make thee a fiery serpent, and set it upon a pole: and it shall come to pass, that every one that is bitten, when he looketh upon it, shall live.

And Moses made a serpent of brass, and put it upon a pole, and it came to pass, that if a serpent had bitten any man, when he beheld the serpent of brass, he lived. And the children of Israel set forward, and pitched in Oboth. (Numbers 21:5-10)

This account may be summarized by saying that the children of Israel complained to God and to Moses because of their wilderness journey, only manna to eat, and no continual supply of water. Their complaint against God and His provision together with complete lack of faith brought swift and severe judgment at the hand of God in the form of many poisonous snakes suddenly appearing, biting and killing a number of people.

The Israelites soon realized their mistake, confessed their sin and asked Moses to intercede for them. God told Moses to provide a brass serpent fastened to a tall pole whereby all who obediently looked upon the serpent would be immediately healed of the venomous bites of the snakes.

The true meaning of this story is clear and is readily understood by Bible-believing Christians. However, in two rather widely used parasitology textbooks on the college level (Arthur W. Jones: Introduction to Parasitology¹ and Asa C. Chandler: Introduction to Parasitology²), the "fiery serpents" are claimed to be guinea worms (Dracunculus medinensis) which caused "burning pain," and were removed by carefully winding them each (a few turns each day) on a stick as they were drawn from the festered sore. However, after a careful scrutiny of facts regarding the guinea worm (the female of which is about three feet long and lives just under the human skin, causing a long continuous welt on the surface), along with facts relating to the actual situation, the textbook hypothesis seems quite erroneous.

In the first place it is probable that poisonous snakes were very common in the desert of Arabia. In Deuteronomy 8:15 we read: "who led thee through that great and terrible wilderness, wherein were fiery serpents, and scorpions, and drought, where there was no water; who brought thee forth water out of the rock of flint." This

suggests that poisonous snakes already in the desert suddenly became very aggressive in attacking many people.

tacking many people. The expression "fiery serpent" probably does not refer entirely to the painful bites of snakes or guinea worm attacks, but might as readily refer to bronzy color of the snakes. In verse eight of Numbers 21, Moses was asked to make a "fiery serpent" and place it on a pole. Later it is referred to as a brazen serpent, the brass also being the type of altar whereby sins were atoned for in the tabernacle in the wilderness.

The time element greatly favors literal poisonous snakes causing fatal or near fatal bites since it is recorded that "much of the people died." Moses probably was able to melt some brass in a few hours and form the brass serpent and place it on a pole the same day. Thus those many who had not died had the opportunity to look at the brass serpent on the pole and be instantaneously healed. The spiritual significance of this is given in John 3:14, 15.

As to another point, the length of the life cycle of the guinea worm, from ingestion of larvae to the maturing of the worm under the skin would require over a year.³ In addition, it would have taken from ten to fifteen days for Moses to extract a single worm. Since each worm is only one or two millimeters in diameter and lacks an exoskeleton, it would have dried and shrunken some if somehow fastened to the upper part of a pole in the desert.

And it is estimated that there was a total of about one and one-half million people in the entire camp, so they surely could more readily behold a brazen serpent than a soft worm the diameter of a string.

The brazen serpent which Moses made was retained by the children of Israel for over 700 years (according to Ussher's chronology), and was used as an object of worship and sacrifices. It was finally broken in pieces by King Hezekiah of Judah (II Kings 18:14).

On the basis of the Biblical account of the incident in Numbers 21:5-10, scientific facts, and obvious implications, it seems most logical to conclude that poisonous snakes rather than parasitic guinea worms were the real "fiery serpents."

References

¹Jones, Arthur W. 1967. Introdutcion to parasitology. Addison-Wesley Publishing Co., Reading, Mass., pp. 244-251.

²Chandler, Asa C. 1955. Introduction to parasitology. John Wiley and Sons, Inc., N. Y., p. 490.

³Jones, *Op cit.*, p. 245.